Attachment 1

For a narrow-band forward carrier: reception of a 64 kbps carrier by a 1.8 m terminal using 7/8 FEC and QPSK modulation. C/N threshold equal to 10.2 dB and minimum clear sky margin equal to 1 dB. The spacecraft eirp of 12.3 dBW corresponds to approximately 4 dB below the blanket licensing limit of 6 dBW/4kHz for this 40 kHz carrier.

$Goa := -10$ ... Off-Axis gain of earth station toward the interference source (dBi)

$n := 0.65$ ... antenna efficiency (%)

$S := 35788$ ... Range of satellite (km)

$freq := 11.95$ ... operating frequency (Hz)

$$lamda := \frac{3 \cdot 10^{8}}{freq \cdot 10^{9}}$$ ... wavelength (m)

$lamda = 0.025$

$L := 20\log(S) + 20\log(freq) + 92.45$ ... Path Loss (dB)

$L = 205.072$

$D := 1.8$ ... earth station diameter (m)

$CI := 17$ ... carrier to interference level (dB)

$Gr := 20\log(D) + 20\log(freq) + 10\log(n) + 20.4$ ... Antenna Gain (dB)

$EIRP := 12.3$ ... Satellite downlink power (dBW)

$$G\_1m2 := 10\log\left(\frac{4 \cdot \pi}{lamda^{2}}\right)$$ ... Gain of 1m^2 antenna (dBi)

$G\_1m2 = 42.997$

$C := EIRP - L + Gr$ ... carrier power at the receiver (dBW)

$C = -147.59$

Assume a C/I of at least 17.0 dB, then

$I := C - CI$ ... interfering signal (dBW)

$I = -164.59$

$pfd\_i := I - Goa + G\_1m2$ ... pfd of interferer in dBW/m2

$pfd\_i = -111.593$

$$E\_i := \sqrt{120 \cdot \pi \cdot 10^{\frac{pfd\_i}{10}}}$$ ... interfering signal in V/m at the input to VSAT

$E\_i = 5.111 \times 10^{-5}$

$EFI := E\_i$

... electric field intensity when radar detector is 3 m away from VSAT

$EFI = 5.111 \times 10^{-5}$

... assume radar detector is 5 m away from VSAT

$EFI := E\_i \cdot \frac{5}{3}$

$EFI = 8.518 \times 10^{-5}$ ... V/m measured at 3m